Commander’s Corner

Capt. Bruce Urbon
Commander
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Stryker: Dictating the Battlespace
The U.S. Army's fleet of Stryker Family of Medium Tactical Vehicles remains a critical piece of DoD's ground combat puzzle, offering advanced lethality, mobility and survivability.
By Chad Samuels

C-5M: Might in Flight
Dubbed the Super Galaxy, the C-5M joins the U.S. Air Force cargo aircraft fleet boasting upgraded engines and avionics, communications, navigation and safety systems, and reliability rates.
By Mark Diamond

MDM: Innovations on Display
A&M gives readers updates on the latest products and programs.
By Marty Kauchak

Dismounted Armor: Less Vest, Greater Test
The next generation in vest body armor uses a single-layered nylon fiber that can offer improved protection at three quarters the weight.
By Chad Samuels

LAV: Enhancing Survivability and Lethality
The U.S. Marine Corps is implementing sweeping efforts to modernize its fleet of tried and true light armored vehicles (LAVs).
By Chad Samuels

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Letterkenny Depot
Comprising over 17,500 acres, U.S. Army Depot Letterkenny is one of DoD's primary installations in the maintenance, modification, storage and demilitarization operations of tactical missiles and ammunition.
Insights

As 2010 draws to a close, DoD continues to develop and field critical requirements to the warfighter facing insurgent and environmental threats in Afghanistan. A good portion of these requirements involve the modernization of tactical ground vehicles essential to achieving battlespace dominance. As the U.S. prepares for final wartime troop withdrawal from Iraq by summer 2011, much of what has been accomplished in terms of stability and security in the region will be dependent on counterterrorist success two nations to the east.

In this issue, readers are treated to an in-depth interview with Capt. Bruce Urbon, as he details SSC Atlantic’s work to develop solutions to enable critical information dominance. Across CENTCOM, the fielding of modernized Stryker platforms is enabling greater reach for key BCT-led support personnel. The U.S. Marine Corps’ fleet of Light Armored Vehicles (LAVs) is seeing significant upgrades within the latest LAV variant, a more “intelligent” version of the Corps’ A2 platform. Also, the latest in SATCOM on-the-move technologies is enabling mission critical comms at speed across all types of hostile terrain.

U.S. Army Depot Letterkenny, November’s Emerging Forecast, is one of DoD’s leading facilities in depot-level maintenance, manufacturing, sustainment, field-level support of weapons systems, soldier systems, and munitions and missiles. In the unmanned systems arena, A&M offers readers a look into the work that SPAWAR Systems Center-Pacific (SSC-P) is doing to develop the next-generation of unmanned surface vessel (USV) technologies. This issue’s Strategic Leadership column profiles Army Program Executive Office (PEO) Missiles & Space (M&S) as the command gives readers a look at its mission objectives and division breakdown.

As always, your comments and questions are welcome. Thank you for your continued readership!

Chadwick “Chad” Samuels
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Letters to the Editor

Dear Editor:
I find myself waiting expectantly each month to receive critical news of events and equipment, with military relevance, from Armor & Mobility. This publication has consistently provided up-to-date and accurate information I find most useful. An excellent source of mission information.

Chaplain (1LT) Erik Myhrberg
USAR
USASOC
USACAPOC (A)

To whom it may concern:
I recently by happenstance obtained a copy of Armor & Mobility from another office here at HQ USSOCOM.

I am the Test Manager for the PMO, Family of Special Operations Vehicles (FOSOV), USSOCOM, as well as a Chief Warrant Officer, USMC Reserves; I found several articles and vendor ads of high value for some of our future programs, and very informative of what else is going on in the community.

Very Respectfully,
Brett Womble
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The U.S. Army’s fleet of Stryker Family of Medium Tactical Vehicles remain a critical piece of DoD’s ground combat puzzle, offering the advanced lethality, mobility and survivability necessary to influence the direction of battle.

By Chad Samuels

During the course of multiple deployments in support of operations in Iraq and Afghanistan, the Stryker Brigade Combat Team (SBCT) Project Management Office (PMO) has provided commanders with an array of appliqué kits that have addressed specific theater needs for their Stryker family of vehicles. These appliqué kits are responsible for improvements as simple as a new air horn and as advanced as improved communications equipment or underbelly or side armor.

These initial capability improvements are intended to allow the Stryker platform to receive additional capabilities in the future with a goal of not impacting the system’s size, weight and power-cost (SWaP-C) capabilities. Improvements include a larger engine for increased mechanical power; a power management system with the ability to manage the available and increased electric power; a 60,000 pound suspension system with appropriate wheels to provide the necessary mobility characteristics of the Stryker at a 60,000 pound Gross Combat Weight (GCW); and various survivability improvements, to include the double “V” hull (DVH) design.

“With each kit there is one common constant - they draw against the original Stryker’s designed space, weight, power and cooling limits,” said SBCT PMO officials. “The Army has an understanding of these limitations and, in conjunction with General Dynamics Land Systems, has conducted the appropriate Systems Engineering Modeling and Simulation along with engineering trade analysis to determine technological improvements to regain capability and to address the future needs of the Stryker U.S. Army Training and Doctrine Command (TRADOC) capabilities manager.”

Survivability

Each Stryker vehicle utilizes an advanced armor system consisting of three layers. Ballistic steel surrounds the vehicle in the form of bolt-on armored panels that make repairs or replacement of armor in the field simple. Ceramic armor layers are key component in the Stryker’s protection. Of the IEDs encountered in hostile environments, many are appearing with a copper or brass jacket that is heated to an extremely high temperature after detonation, melting through steel and allowing a lethal steel penetrator to pass through conventional armor systems. Ceramic armor counters the molten metal, preventing incursion of the steel penetrator.

The Stryker platform has undergone the addition of a reactive armor system comprising tiles that fasten to the exterior of the vehicles, allowing them to better withstand
hits from a variety of anti-armor munitions, primarily rocket-propelled grenades (RPGs). Designed by GDATP and Rafael, the reactive armor kitting is replacing the current slat armor currently used with Strykers in theater. Called Stryker reactive armor tiles (SRAT) reactive armor, an evolution of SRAT from phase I to II has led to an estimated 10-15% weight reduction with both armors offering approximately the same ballistic performance.

According to Col Robert Schumitz, Project Manager, Stryker Brigade Combat Team, “The SBCT modernization strategy provides survivability upgrades and regains sufficient mobility and SWaP-C margins projected for the current fleet and future warfighter requirements.”

The Stryker add-on armor is the second reactive armor program GDATP is jointly conducting with Rafael. The two companies are cooperating on the supply of reactive armor systems for the M-2 Bradley. Two years ago, GDATP also competed with its own reactive armor solution, and won another program, for the delivery of reactive armor kits for the M-1A1/A2 Abrams tanks. The reactive armor solutions currently offered by Rafael are representing enhanced capabilities over the tiles employed on previous systems, including improved effectiveness, protection against a wider range of threats and increased safety, utilizing insensitive sheet explosives activated only when triggered by shaped charges. The Army’s long term plan for RPG protection is to integrate an active protection system into its combat vehicle systems, including the Stryker Family of Vehicles. As the prime contractor and systems integrator for the Stryker, GDLS will be assessing active protection systems for potential application to Stryker in the future.

Hull Redesign

In April 2010, a team of General Motors and General Dynamics Land Systems received a $58.3 million cost-plus, fixed-fee contract for a modified hull design for the Army’s Stryker vehicles to improve performance and survivability in Afghanistan.

“Force protection is an imperative when addressing the modernization of systems. The current double v-hull effort addresses survivability improvements pulled forward from the planned Stryker modernization effort,” said Schumitz. “The DVH effort will better protect Stryker soldiers from the blast effects of IEDs in theater.”

Under the contract, General Dynamics Land Systems is providing design and integration engineering services, test articles/prototypes, and procurement of materials, including long-lead materials, to support the modified hull design with related integrated system changes. Army officials estimate the vehicle’s modification will cost $800 million with orders anticipated to reach 450 for theater needs in Afghanistan.

Under previous plans, the Army planned to reduce production to 20 Strykers per month by next January, according to an industry source. The current plan aims at introducing a new double “V” hull design before the next Stryker brigade deployed in July 2011. Army estimates that the design integration, prototype-build and testing will cost $157.7 million. A double V hull test in October 2009 successfully tested survivability equivalent to the MRAP 2 variant, which is about twice that of the original MRAPs.

Suspension Evolution

In meeting DOD requirements of producing a suspension capability for Stryker up to a weight class of 60,000 pounds, a considerable increase over the 41,000 pound ICV platform tested in 2005. Present Stryker platform suspension consists of a front quad (4-wheel) McPherson strut package with rear-wheel quad damping coils. The vehicle is outfitted with compressed nitrogen springs and passive damping valves at the most front and rear wheels.

In the mid 1980’s, LORD Corporation began developing Magneto-Rheological (MR) vibration damping technology, with MillenWorks obtaining a license to the technology. With the first commercial automotive success of MR damping in early 2002 under license to Delphi Corporation (now BWI), the needs of military vehicles were next to be addressed. Vibration mitigation demands of military vehicles are much greater than typical civilian automotive demands. MillenWorks and LORD teamed to develop controllable damping capabilities able to meet the weight and speed demands presented by military platforms.

“In the presence of a magnetic field, the yield shear stress is controlled but the viscosity remains unchanged,” said Jim Yakel, Business Development Manager for Military Ground Vehicles, LORD Corporation, “With MR technology, the variability lies with the fluid as opposed to valve size. This eliminates the complexity and cost of controllable valve-based systems.” Composed of specifically-engineered iron particles within a petroleum base, the fluid can be manipulated by a magnetic field which makes it thicker or thinner depending on the magnetic force applied.

In the late 1990’s, MillenWorks, a strategic business of Textron Marine & Land Systems, an operating unit of Textron Systems Corporation., began work to evolve suspension designs for military vehicles. MillenWorks focused on a promising leap-ahead technology called Magneto-Rheological (MR) damping. The latest evolution of that work has resulted in an MR damper suspension completing 3,000-miles of third-party endurance testing in October 2010 at Aberdeen Proving Grounds.

MR Breakthrough

In 1999, MillenWorks proposed an upgrade to the standard HMMWV suspension using
Magneo-Rheological technology and was awarded a Small Business Innovative Research (SBIR) contract through TARDEC. After a Phase I design evaluation, MR was tested in 2001 in the first of what would become three SBIR contract phases. In 2003 in the Phase II contract, the MR suspension was scaled to work on a Stryker Infantry Carrier Vehicle (ICV). Successful performance testing in 2005 spurred the current Phase II contract through TARDEC valued at $4.4 million. Phase III of the current contract is intended for the development and endurance testing of a sixty thousand pound (60k) version of the active suspension dampers.

“Our challenge was meeting the suspension performance benchmarks we set in 2005 under the stress of significantly increased platform size and weight,” said Peter LeNoach, Director, Suspension Systems, MillenWorks. “To achieve this, we took a fresh approach at combining the gas spring with MR damping technology, with special attention paid to reliability. Supporting Stryker Modernization (SMOD) requirements for upcoming fall 2010 testing, the current Stryker suspension upgrade is addressing an increase in a variety of platform stock components from the original General Dynamics-made vehicle.”

Current Stryker variants have ride height adjustable suspension system with passive damping. Primary to the Stryker suspension upgrade is an active damping system. In contrast to a passive damping system which uses “fixed” characteristics to accomplish vibration mitigation in direct relation to the speed a vehicle is traveling, active damping technology goes a step further by manipulating the forces put on a vehicle in response to variables such as wheel and chassis position to better control energy dissipation thus creating greater chassis isolation for a smoother ride.

“The apparent fluid viscosity is changed by the magnetizing of the iron particles though scientifically, a viscosity change is not actually occurring,” said LeNoach. “Through an electro-magnet within the damper system, variable electrical current creates a magnetic field, which in turn, changes the alignment of iron particulates within the passing fluid. This change in particle alignment gives the fluid greater or lesser vibration absorptive potential by changing the speed with which it moves through a fixed damper orifice. Ultimately, the goal is to create a force control range as large as possible in keeping the vibration transmitted to the vehicle as small as possible,” he added.

At the heart of the MR suspension is a computer-controlled sensory system that analyzes wheel velocity and position relative to the vehicle’s chassis, as well as chassis orientation. Like a voice coil in your cars speakers, an amplifier delivers very small amounts of electrical current to create the force needed to control vibration and the overall vehicle’s stability.

“Combining this variable damper with an adjustable nitrogen gas spring in a single hardware unit per wheel station, we retain the Stryker’s height management system functionality,” said LeNoach. “Our control system is specifically designed for high-bandwidth modulation of damper forces at each wheel in near real-time.”

To date, the MillenWorks/Lord MR damping system iterations have been tested on the Stryker ICV, MGS, and MEV variants, however, it is likely that the technology will be evaluated for future fleet-wide implementation.

**Digital Upgrade**

Force XXI Battle Command Brigade and Below (FBCB2) is a critical part of the Stryker’s digital capabilities. Using GPS signaling, FBCB2 blue tracking sends a satellite signal through space providing instant tracking capabilities to any level of command. The FBCB2 plots paths and passes information regarding potential dangers, locations of friendly vehicles and discriminates between old and new data. The operator can view either a topographical or a satellite map on any grid.

Vehicle operators may choose to utilize the Stryker’s DVE (driver visual enhancement) technology, a digital heads up display from the driver’s perspective presenting an image based on thermal dynamics. The Stryker’s DVE is used to identify IED carriers. When insurgents carry an IED, their body temperature is lowered by the metal artillery shell and core temperature is passed on to the device. This transfer of heat enables DVE operators to identify the insurgent in a crowd of people due to the difference in core body temperature.

**Ahead**

The double V Hull (DVH) effort is part of Stryker Modernization which addresses a specific operational need statement from the Stryker brigade commander. “The goal of the DVH effort is to provide an improvement to the ballistic capabilities of the underside of the Stryker,” said SBCT PMO officials.

The Army is currently waiting on the results of DVH testing prior to requesting a Stryker Modernization Program of Record for insertion into the Program Milestone process. “Once DVH test results are released and authorization is received for the Stryker Modernization effort to become a Program of Record, the Army can begin the design work necessary for the integration of power/power management improvements, suspension improvements, C4ISR improvements and various survivability improvements,” SBCT PMO officials added.
Shooter Detection: Life-saving, Sniper-deterring

Warfighters driving through Afghanistan in noisy military Stryker vehicles face a lethal threat beyond roadside bombs and rocket-propelled grenades. They are being targeted by snipers and rogue shooters.

Noise is also a real enemy," said Mark Sherman, vice president and general manager of Boomerang, Raytheon BBN Technologies. “Inside the Stryker is so loud that often times, warfighters sitting across from each other have to shout to be heard and are unaware they are being shot at until something – or someone – is hit. Even if they realize they are under attack they have a hard time figuring out where the attack is coming from,” he added.

To solve this problem, the military has outfitted many of its Stryker vehicles in Afghanistan with the Raytheon BBN Technologies Boomerang shooter detection system. The system quickly and accurately identifies enemy shooters’ location while stationary or on the move at over 60 MPH. Boomerang is the least expensive shooter-detection system available, easiest to deploy and has consistently proven itself more effective than others.

The system uses passive acoustic detection, computer-based signal processing and both aural and visual indications to help U.S. warfighters locate the shooter in urban or open terrain. Seven small microphones on a mast attached to the back of the Stryker capture the supersonic shockwave of a passing bullet.

In less than one second, the system recognizes incoming fire and the relative shooter position (including elevation) and its computer-generated voice shouts out the origin of the enemy fire and displays the information on a visual monitor. The system uses the positions of a clock to give warfighters an initial indication and a more detailed azimuth location on the LCD display.

“Because any system that calls “wolf” too often would quickly be dismissed, Boomerang is engineered to not alert for events such as road bumps, door slams, wind noise, tactical radio transmissions, vehicle traffic, firecrackers, and urban activity,” said Sherman. “Just as importantly, it will also not alert when outgoing shots are fired.”

Boomerang is easily integrated with situational awareness and response systems. Such integrated Boomerang systems not only tell warfighters where the shooter is located, but also can automatically slew a gun to the target or immediately notify other units or higher command of the situation.

For more info: www.bbn.com
SCOTT AIR FORCE BASE, IL. – During a recent operation in support of the nation’s 30,000 troop plus-up in Afghanistan, Air Mobility Command’s newest C-5 airlifter got a chance to flex its M-model muscles.

And according to those closest to the operation, the results were impressive.

Dubbed the C-5M Super Galaxy, the newest C-5 to join the AMC fleet boasts upgraded engines and avionics, enhanced communications, navigation and safety systems, and improved reliability rates.

During a recent 30-day mission, 10 C-5 aircraft – two M models and eight legacy A- and B- model C-5s – transported more than 100 U.S. Army helicopters and more than 400,000 pounds of related equipment from Rota Naval Air Station, Spain, to various airfields in Afghanistan, including Bagram and Kandahar.

According to AMC officials, although 10 aircraft were used, at any given time only four or five aircraft (including the two C-5M Super Galaxies) were transporting helicopters downrange. Officials said the mission was planned using two C-5Ms and two C-5Bs; however, as the legacy C-5B aircraft went down for maintenance, they were replaced with other A- and B-model C-5s.

The pre-staged helicopters and cargo belong to the U.S. Army’s Combat Aviation Brigade, 4th Infantry Division. The 2,600-member Fort Hood, Texas, unit is slated to deploy to Afghanistan this month.

As part of a U.S. Transportation Command multimodal movement, the Army equipment was initially transported to Rota NAS by ship. From there, AMC Airmen loaded the equipment onto the C-5s and delivered it directly into landlocked Afghanistan.

This multimodal operation maximizes available resources by combining the immense carrying capacity of sealift with the swift, “anywhere-anytime” capability of airlift.

AMC officials said the entire operation was a great example of the services working together under the umbrella of USTRANSCOM to support the joint warfighter, and a perfect example of the capabilities the Defense Department gains from the new C-5M Super Galaxy.

Colonel Patrick Cloutier, Rota NAS Stage commander for the operation and vice commander of the 439th Airlift Wing (Westover Air Reserve Base, MA.), said the upgraded C-5Ms outperformed the A- and B-model C-5s.

Because of maintenance issues with the legacy C-5s, he said they employed eight C-5A/Bs to generate 23 missions, while the two C-5Ms generated 22 missions. And although the Super Galaxies flew one less mission, Colonel Cloutier said they hauled 55 percent of the total cargo.

AMC officials said the C-5Ms completed the operation with a 96 percent maintenance departure reliability rate vs. an 82 percent rate for the A- and B-model C-5s.

Even more impressive, according to the colonel, at one point during the early days of the operation, he said they were turning a single C-5M every eight hours without “missing a beat.”

“In short, the C-5M did what it was designed to do; deliver cargo more effectively and efficiently than its predecessor,” Colonel Cloutier added. “We’re just now realizing everything this incredible aircraft can do.”

Captain Cory Damon, a Dover aircrew member involved in the operation, added, “[The crew] wore out before the C-5M did.” He said it was the first time he’d seen this happen during his C-5 career.
Colonel Cloutier said that the two factors that make the C-5M stand out are reliability and performance. In fact, he said the operation ended two days earlier than planned; an accomplishment he attributes to the C-5M’s outstanding reliability and performance.

**‘Birth’ of the Super Galaxy**

In 1998, AMC began an aggressive program to modernize all remaining C-5Bs and C-5Cs and many of the C-5As in its inventory. The C-5 Avionics Modernization Program (AMP) included upgraded avionics, improved communications, new flat panel displays, improved navigation and safety equipment, and a new autopilot system. The first flight of the first AMP-modified C-5 (tail number 85-0004) occurred on Dec. 21, 2002.

Another part of the C-5 modernization plan is the Reliability Enhancement and Re-engining Program, or RERP, which includes new General Electric CF6-80C2 engines, pylons and auxiliary power units, with upgrades to the aircraft skin and frame, landing gear, cockpit and pressurization system.

The C-5 aircraft that undergo both the AMP and RERP upgrades are designated C-5M, also known as the “Super Galaxy.” The Air Force plans to upgrade 52 Galaxies to “super” status by the end of 2016.

Each of the C-5M’s CF6 engines produces 50,000 foot-pounds of thrust, up from the 43,000 pounds generated by the older General Electric TF-39 engines. The 22 percent increase in thrust results in a 38 percent higher climb rate to initial altitude, a significantly increased cargo load, and a longer range between refueling.

To put this into perspective, a C-5M with 50,000 pounds of fuel only needs 1,500 feet of runway to get airborne, while the legacy C-5s need between 3,000 to 4,000 feet. Additionally, a C-5M, at an average Takeoff Gross Weight above 600,000 lbs, can climb to cruising altitude of 34,000 feet in 18 minutes while legacy C-5s need 33 minutes to reach 25,000 feet. The faster climb saves fuel since less is needed at its cruising altitude.

The AMP and RERP modernization programs are expected to raise the Mission Capable Rate to a minimum wartime goal of 75 percent, at an average procurement unit cost of $119 million per plane, which includes the aircraft and logistics support.

And the warfighter isn’t the only one who benefits from Super Galaxy; the Air Force estimates the C-5M will save taxpayers in excess of $17 billion over the next 40 years.

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This year’s Modern Day Marine Exposition at Quantico once again allowed the industry team to unveil its latest vehicle and system developments. A&M was on the conference floor to gain insights from industry representatives about their products and programs.

**Multiple Systems and a New Vehicle**

Oshkosh Defense unveiled two significant enhancements for the High Mobility Multipurpose Wheeled Vehicle (HMMWV) – the company’s TAK-4 independent suspension system and vee-shaped underside armor. Together, these upgrades expand the vehicle’s mission capabilities for the Marines – including off-road mobility, ground clearance, ride quality and survivability against underbody IED blasts.

Installing the TAK-4 suspension on HMMWVs provides a number of benefits, John Bryant, Oshkosh Defense vice president and general manager for Marine Corps programs, told A&M. Some of the vehicles’ enhanced capabilities include a 70 percent off-road profile capability and 14 inches of independent wheel travel, and ground clearance increased to 17 inches. “The current HMMWVs loaded down with all their personnel equipment and armor systems, they refer to them as ‘low riders’ because they’ve lost about five inches [of ground clearance]. So for a vehicle operator, that severely restricts your cross-country mobility – and this gains it back again, and it does it with the full payload and full armor,” Bryant pointed out.

The underbody protection on legacy HMMWVs restricts the scope of their operations in the Afghanistan theater. Oshkosh’s efforts in this area are expected to dramatically increase the vehicles’ employment options. “The vee blast plate significantly improves that underbody protection,” Bryant emphasized.

Navistar Defense introduced its new high-mobility medium tactical vehicle (MTV) during the exposition. Based on the proven International 7000-MV platform, the vehicle incorporates the DXM independent suspension and can also accommodate a variety of survivability and armoring solutions derived from the International MaxxPro Mine Resistant Ambush Protected vehicle.

The company recently completed building 1,130 MaxxPro Dash vehicles with its DXM independent suspension for fielding in Afghanistan. “An additional 1,222 Dash units already in operation will also soon be retrofitted with the DXM suspension solution,” said a statement provided by Elissa Koc, Navstar Defense manager of communications.

Capable of climbing a 60 percent gradient and maneuvering 40 percent side slopes, the high-mobility MTV also incorporates automatic traction control, anti-lock brakes, self-diagnostics and advanced electronics systems. Additional options include MaxxForce D 9.3L and 13L powertrain offerings as well as a central tire inflation system.
**Individual Subsystems**

Robertson Fuel Systems reported that it has introduced a survivable fuel system (SFS) to replace the existing fuel tank on the Bradley Fighting Vehicle (BFV). The SFS contains fuel following an explosive event allowing additional time for the vehicle's crew to escape and complete other post-event tasks.

Robertson Fuel Systems' internal developmental programs to provide an SFS-like solution for other DoD vehicles include a design for the HMMWV, “That will be ready in early 2011 and would be a drop-in replacement for the existing tank,” according to Robertson's chief ground vehicle fuel system engineer, Matt Whipple.

Other ongoing efforts include designing a fuel system with BAE for the AAV. That prototype system will be ready for testing later this year or early 2011.

For its part, Hutchinson has also elevated vehicle survivability through its recently fielded tire shield. The device addresses the vexing problem of reducing sidewall damage to vehicles on the contemporary battlefield. David Kritzell, manager of military sales and marketing at Hutchinson, told A&M that the tire shield protects the sidewall when in service from snags, scrapes and other potential damage. Hutchinson's developmental efforts for this product are eyed at providing ballistic protection.

The tire shield may be found in service in Afghanistan.

The Takata Intelligent Seatbelt System (TIS2) is an off-the-shelf, motorized seat belt system that automatically adjusts belt length and tension to fit the wearer's size and shape, giving the user a high level of comfort and freedom of movement, while providing a increased level of occupant survivability. Takata has discussed the utility of the TIS2 in DoD vehicles with department and other industry representatives.

Stacy Schwartz, a Takata product engineer and new business development representative, pointed out the system uses detensioning and other technology found in legacy, commercial seatbelt systems, but adds a motorized component, a restraint control module (RCM) and other enhancements. “The RCM is mounted at the center of gravity of the vehicle, so that it senses a roll over or other event since it has tri-axis [x, y, z] accelerometers. The RCM tells the seat belts to pull in webbing and for how long based on the length of the incident,” Schwartz pointed out.

A&M tested the TIS2 as it was put through its paces on the exposition floor. In that environment, the belt tension increased and decreased, and other actions occurred on-cue according to different inputs from the operator and the RCM.

Armor Works is developing a random pattern 3-D camouflage applique that provides vehicle signature reduction in all spectrums and reduction in solar heat gain on the vehicle.

Mark Phillips, vice president of sales and marketing at Armor Works, said the camouflage applique's 3-D pattern is random with no repeating patterns and explained the benefits of this strategy. "If you were part of a weapon system interrogating this [vehicle] from a distance, there are look up tables that they are using to help identify this vehicle. This keeps you from getting planer surfaces, like on other cheaper [2-D camouflage pain] surfaces, to identify the silhouette."

Phillips revealed a recent company effort to collaborate with the Army's TACOM and M.I.T. scientists supporting military research, to examine the interaction of the camouflage applique with air-to-ground missile and, in particular, the seeker head.

The recently developed Armor Works camouflage applique is being retrofitted to military vehicles for demonstration purposes at defense conferences through the fall season.
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DRS.com/GoTo
Capt. Bruce Urbon hails from Shaker Heights, Ohio and is a graduate of The Ohio State University where he earned a bachelor of science degree in aeronautical & astronautical engineering in 1985. He later attended the Naval Postgraduate School in Monterey, CA, and was awarded a master of science degree in astronautical engineering in 1992. During his tour at the Naval Postgraduate School, Urbon was selected for lateral transfer to the engineering duty officer community.

Urbon’s sea assignments include service as first lieutenant and then main propulsion assistant on the USS Miller (FF-1091) where he qualified as surface warfare officer and engineering officer of the watch. Urbon was then assigned as navigator in Second Fleet Flagship, USS Mount Whitney (LCC-20). He also completed a tour serving as the combat systems officer aboard the USS Theodore Roosevelt (CVN-71).

Following postgraduate school, Urbon was assigned to the Office of Naval Research and assumed duties as program manager for the Precision SIGINT Targeting System (PSTS) Advanced Concept Technology Demonstration (ACTD). In 1997, Urbon was assigned to the SPAWAR Space Field Activity (SSFA) where he served as a systems engineer on a multi-billion dollar ACAT 1D-equivalent reconnaissance satellite acquisition program. During this tour, he completed DSMC’s Advanced Program Management Course and received Level III certification in the field of program management. He was also selected for membership in the Navy’s acquisition professional community and was identified as a member of the Navy Space Cadre.

In 1999, Urbon reported to Space and Naval Warfare Systems Command (SPAWARSYSCOM) where he served as fleet support officer and program manager for the Next Generation Command and Control Processor (NGC2P). In 2002, Urbon was assigned to Fleet Technical Support Center, Atlantic (FTSCLANT) as combat systems department head. Upon completion of his CVN CSO tour in 2006, Urbon was assigned to Space and Naval Warfare Systems Center Charleston (SPAWARSYSCEN Charleston) to serve as the command’s first director of TYCOM / COCOM operations and director of fleet support. In June 2008, Urbon became the seventh commanding officer of SPAWARSYSCEN Charleston. In the commissioning ceremony in September 2008, Urbon became commanding officer of Space and Naval Warfare Systems Center Atlantic.

Capt. Bruce Urbon was interviewed by A&M Editor Chad Samuels.

Q: Please talk about your role as Commanding Officer, Space and Naval Warfare Systems Center Atlantic, U.S. Space and Naval Warfare Command.

A: My role as Commanding Officer (CO) of SPAWAR Systems Center (SSC) Atlantic can’t be beat because our people can’t be beat. It’s my honor to serve as CO of a team that features more than 10,000 civilian, military and industry partner members. Every day I am thankful - and flat out amazed - to be working with such a great team.
with such a talented team that conducts $5 billion in annual business - and maintains a laser-eye focus on helping naval, joint, national and coalition warfighters cope with the dangers of the 21st century.

SSC Atlantic is an engineering organization that is a key component of Team SPAWAR. We develop solutions for customer organizations that enable end-users to have a critical edge in Information Dominance.

SSC Atlantic is in the “freedom business.” We develop, deploy and support solutions that enable warfighters to strike anyone, anywhere, anytime. As CO, I am charged with ensuring non-stop ethical, operational and regulatory compliance. Across the board, our team consistently makes my job truly rewarding. There’s a heritage here at SSC Atlantic. It’s one of those organizational DNA dynamics that runs in our bloodstream. This heritage is all about delivering solutions that make the seemingly impossible - possible. It reminds me of NASA’s culture during the Apollo space program. It’s like that here. We channel our collective energies to deliver secure, integrated and innovative solutions that are ready-for-tasking by dozens of naval, joint and national agencies. Those agencies include: Navy, Marine Corps, Army, Air Force, Unified Combatant Commands, Department of Defense, Department of State, Department of Veterans Affairs, Department of Justice, Department of Treasury, Department of Homeland Security, Federal Aviation Administration, National Science Foundation to name but a few. We are 120 military, 3,500 civilians and 9,000+ industry partners strong – all supported by stateside offices in Florida, Louisiana, Maryland, North Carolina, South Carolina Virginia and Washington D.C., as well as overseas posts in Europe, the Mideast and Antarctica. Together we design, acquire, engineer and sustain the sensor connections, cyber network infrastructures and knowledge management services that ensure timely and trusted information is available where it is needed, when it is needed and only to those who need it.

Part of my job is to chart the course ahead. DoD and Navy leadership have set the vision. They rely on commands such as ours to help execute that vision. Adm. Roughead, our Chief of Naval Operations (CNO), has called for information dominance to become a main battery of naval warfighting capabilities. He is leading the effort to add cyber power to the proven capabilities of sea and air power. The CNO seeks to remain pre-eminent in the fields of intelligence, cyber warfare, command and control, electronic warfare, and battle / knowledge management. Defense Department Secretary Robert Gates has heightened everyone’s fiscal awareness with his efficiency initiative. The Secretary supports solutions designed for affordability and not desire. Here at SSC Atlantic we are ready to answer all bells. We express our FY11-FY14 strategy as ‘We make IT count for the Warfighter and the Nation.’ Here’s a quick synopsis of our strategy.

**Goal 1:** Strategic effects that provide innovative solutions for today, tomorrow and beyond. The major takeaways here are: Serving as the provider of choice in elevating Information Dominance as a core warfighting capability; delivering full spectrum solutions that allow our customers to dominate and are accepted by them on the first pass; and exercising resource stewardship that makes every dollar count.

**Goal 2:** Operations management that delivers solutions with quality, speed, agility and value with focus on: Unsurpassed customer relations management, recognition for our S&T contributions, best-in-class engineering and project management, non-stop continuous process improvement, minimal carbon footprint, making every square foot count, proactively managing complex change and balancing government and industry intellectual capital.

**Goal 3:** Organizational development that empowers each individual to make a difference with emphasis on: Building great careers for our employees, working with schools to help develop our future workforce, developing great public service leaders, harvesting the power of teamwork and ensuring open and transparent communications.

Those goals and objectives are each fortified with a balanced set of robust performance metrics. One Team with shared purpose, One Plan with shared priorities and One Future with shared successes.
Q: From a joint and coalition global perspective, how is SSC Atlantic addressing the needs of the enhanced systems interoperability and force integration?

A: As a field component of the Space and Naval Warfare Systems Command, Team SPAWAR, our primary focus is naval. That's our sweet spot. Secretary Gates has called for a broadened portfolio of solutions whose designs and investments can be leveraged and rapidly fielded to a wide range of customers. Enhanced systems interoperability and force integration form the central thesis of our operations throughout Team SPAWAR. We see the national defense space as one where joint warfighting forces and their supporting organizations are interconnected in a networked, collaborative environment. This connected space enables every shooter to shoot, every decider to decide and every supporter to support – all linked together to leverage their net effects and maximize their net effects contributions to the joint warfighting mission.

The keys to making all of this work are strong partnerships with our program sponsors and multi-use, integrated solutions. We have many examples of success such as Joint Threat Warning System, command centers, joint operational centers, health systems, air traffic control, software engineering and in-theater Internet Cafés. The example that has garnered the most recognition involves our C4ISR integration role on MRAPs - Mine Resistant Ambush Protected - vehicles. MRAP vehicles are a family of armored fighting vehicles designed to provide complete warfighter protection from IED attacks and ambushes.

In May 2007, Secretary Gates stated that the acquisition and fielding of MRAPs were DoD's highest priority. For our MRAP effort, we leveraged the successful partnership equity we had built earlier with the sponsors of the Up-Armored Humvees C4ISR integration project. We quickly applied our team's experience, integration facilities, tooling and industry partnerships to speed the integration of the C4I systems on each MRAP. The result is that more than 23,000 vehicles in the MRAP family have been successfully outfitted thus far. They're out there saving warfighter lives.

At the end of our MRAP assembly line we slip a simple 8-and-a-half-by-11-inch certificate onto the dashboard. It reads: “The SPAWAR MRAP Team has integrated the electronics capabilities on this MRAP with care and pride. We have done our job so you can do yours. Our goal is your safe tour of duty and return home.”
Q: From an enterprising perspective, how is SSC Atlantic working to promote partnering with industry in delivering more effective and efficient know-how to the warfighter?

A: At 9,000+ strong, our industry partners are a key component to our success. Let’s take a look at the numbers. SSC Atlantic’s outsourcing requirements have grown from $833 million in obligations in FY01 to over $3.45 billion in FY09. We apportion this business with mid-size companies handling 52 percent of our business, small business has 34 percent and major DoD firms cover 14 percent. Presently, we are leveraging our matrixed organizational structure — called Competency Aligned Organization (CAO) — to reduce overhead expenditures and process duplication while increasing the quality of products and services delivered to warfighter. As we undertake this effort, industry is fully engaged. For example, recently we issued a Request for Information (RFI) asking for industry suggestions to optimize contract services, capitalize on new technologies, identify relevant trends and improve teaming arrangements.

Q: What are some of SSC Atlantic’s biggest challenges since your assumption of command?

A: Big challenges offer big rewards. We like that. I can think of two biggies right off the bat — a merger and CAO. The merger was an organizational transformation executed in October 2008 when we stood down the former SSCs that were located at Norfolk, New Orleans and Charleston. In their place we established the newly-formed “Team Atlantic,” or SSC Atlantic.

This transformation has united our competencies and process capabilities as never before. More importantly the merger had a multiplier effect. It intensified our focus on the critical mission of delivering secure, integrated and innovative solutions that are ready-for-tasking by naval and joint warfighters. As a result, the fidelity of our delivered solutions to the warfighter has improved. We see this in our customer value survey scores. Additionally, the merger improved our stewardship to the taxpayer. Collectively we joined forces to do much more with much less. All of that is good. But not good enough. We needed more. We needed a breakthrough. We needed new way of accommodating our growing work. To do this we examined history.

When the assembly line was established, organizational structures quickly morphed to accommodate that new way of doing business. The organization chart soon mirrored the assembly line. Rigid lines of command and control were found on both. As Web 2.0 took off, we found that silos — both the organizational variety as well as the IT systems kind — were antiquated. Why? The orientation of silo lines of organizational control would not accommodate the speed of information and process flows. We needed a new framework. CAO is it. As the assembly line influenced organizational designs of the past so too has the Internet. The key words are ‘inter’ and ‘net.’

CAO applies a networked framework to our organization. It allows us to combine our people, processes and tools in a matrixed way and positions us to respond much more effectively with present and future challenges. The columns of the matrix — called Competencies — focus primarily on the worker (people, processes and tools). The rows — called Portfolios — deliver the complementing focus on the work (customer relations management, cost, schedule and performance). This is a big shift. And it takes time to enact. I’m pleased we are as far along with CAO as we are because CAO has redirected our organization from a traditional vertical orientation by deploying a network of teams moving diagonally and elliptically across the enterprise.

Under CAO, SSC Atlantic has drastically retooled the way collaboration is applied in solving complex problems and capitalizing on emerging challenges. Applying CAO to the newly-formed SSC Atlantic created exactly the right set of opportunities for cross-team capabilities to successfully serve our customer agencies this year, next year and beyond. And in doing so, we can provide unsurpassed stewardship and returns on taxpayer equities by applying resources in a clearly-focused, evidenced-based and cost-effective manner.

Q: What are some of the key challenges you see facing SSC Atlantic looking ahead with the DoD requirements for the Navy to become more littoral and interdiction-focused to deal with an increasingly asymmetric battlespace.

A: There are three things that come to mind. First, I reflect on the key finding from the 9/11 Commission Final Report. The Committee found the most important failure was one of imagination. Second, I think about the pressing budgetary realities that demand solutions designed for affordability. Third, I think about our efforts to scale our systems to the widest range of customers. Imagination + affordability + scalable can be a tough equation to solve. Yet, as we just discussed therein lie the opportunities.

Needed to overcome the harsh realities of asymmetric warfare for littoral and interdiction is answering CNO’s call for Information Dominance. We can succeed if — and only if — cyber is added to both air and sea power. As your question addresses, we know we’ll continue to need solutions for ‘defense’ and ‘offense.’ On ‘defense,’ we must continue to craft imaginative solutions that eliminate an adversary’s ability to impact by preventing them from ever penetrating our networks in the first place. For ‘offense,’ the ‘OODA loop’ still rules - observing, orienting, deciding and acting faster than the other guy. Key to our future will be our success at researching, developing, deploying and supporting innovative solutions quickly for both ‘defense’ and ‘offense.’ And doing this for the widest range of naval and other designated customers. And doing all of that in a manner that makes every dollar count.

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Managing Mission Spectrum

The U.S. Army Program Executive Office (PEO) Missiles & Space (M&S) is DoD’s premier command for the full lifecycle management of all Army tactical and air defense missile programs and selected Army space programs.

Submitted by PEO M&S Public Affairs

**BACKGROUND**

While the history of many of the technologies used in systems managed by the U.S. Army Program Executive Office Missiles & Space (PEO M&S) can be traced back to the very beginning of Army missile programs in the early 1950’s, organizationally the PEO’s history began with the establishment of the PEO system on 1 May 1987. The establishment of the PEO system for program management was the results of the Goldwater-Nichols Act that reorganized Defense Acquisition. Of the many PEOs established on that date, five eventually evolved into the current PEO MS. Three of these, PEO Forward Area Air Defense (FAAD) and PEO High/Medium Air Defense (HIMAD) and PEO Strategic Defense assumed management of the air defense programs and the other two, PEO Close Combat Missiles and PEO Fire Support assumed management of the close combat and fire support systems.

A major consolidation of programs occurred on 15 September 1988 when PEO FAAD and PEO HIMAD were merged to form the PEO Air Defense (PEO AD) and the two tactical missile PEOs, Close Combat and Fire Support, were combined to form a larger, expanded PEO Fire Support. In July 1992, the PEO AD was merged with the PEO Strategic Defense, with elements of the former U.S. Army Strategic Defense Command (USASDC) and elements of the U.S. Army Missile Command to establish the PEO Global Protection Against Limited Strikes (GPALS). The PEO Fire Support was renamed the PEO Tactical Missiles.

In May 1993, the name of PEO GPALS was changed to PEO Missile Defense (PEO MD) with no change to the mission or resources. In July 1996, the PEO Missile Defense was renamed as the PEO Air and Missile Defense (PEO AMD) to better reflect its mission. In May 2003, following the transfer of Army Space Programs from SMDC to the PEO AMD, the PEO’s name was changed to reflect the expansion of the PEO’s mission. The PEO was renamed the PEO Air, Space and Missile Defense (PEO ASMD). The current PEO Missiles and Space was formed in January 2005 when the PEO Air, Space and Missile Defense merged with the PEO Tactical Missiles. This merger placed all Army missile systems under one PEO for the first time.

**MISSION MANAGEMENT**

The PEO Missiles and Space provides centralized management for all Army air and missile defense and tactical missile programs as well as selected Army Space programs. The PEO is responsible for the full life-cycle management of assigned programs. The PEO Missiles and Space reports to the Army Acquisition Executive and is aligned with the Aviation and Missile Life Cycle Management Command at Redstone Arsenal, AL. This materiel enterprise relationship enhances the PEO’s ability to provide the world’s finest support to our Army, Joint Service, Interagency, and coalition warfighters and customers while continuing the Army’s modernization.

The portfolio of programs assigned to the PEO Missiles and Space spans the full spectrum of the acquisition process from system development to acquisition, testing, production, product improvement, fielding, sustainment, and eventual retirement from the force. A number of programs are joint programs being developed with the other services. Two programs within the PEO are international cooperative development programs, with other countries sharing in the development as full partners.

In addition to specific acquisition programs, the PEO is applying a system of systems acquisition approach to meet the warfighters’ needs and obtain the desired capabilities of the Army Air and Missile Defense (AMD) Future Force. This approach requires the systems to be restructured into components of sensors, launchers, missiles, and Battle Management Command, Control, Communications, Computers and Intelligence (BMC4I) utilizing a standard set of interfaces and networks to communicate.
The Upper Tier Project Office (UTPO) is in charge of successfully transitioning and transferring Army-designated business management directorate (BMD) elements from the U.S. Missile Defense Agency (MDA) in accordance with DoD-approved business rules and specific annexes. UTPO executes a phased transition and integration of Operation and Sustainment responsibilities in accordance with U.S. national security and defense strategies. UTPO establishes Army Upper Tier solutions for theater high altitude area defense, common ground X-band radars, and ground-based missile defense capability that ensures wide area layered BMD elements achieve a global air & missile defense (AMD) capability end state.

**Precision Fires Rocket & Missile Systems PO**

The Precision Fires Rocket & Missile Systems (PFRMS) Project Office manages the Multiple Launch Rocket System (MLRS) family of launchers, including the tracked M270, M270A1, and the wheeled M142 High Mobility Artillery Rocket System (HIMARS), as well as the suite of rockets and missiles for the launchers. MLRS Family of Munitions (MFOM) includes the basic, extended-range, and guided rockets and the Block I/IA and Unitary Tactical Missile Systems.

**Lower Tier PO**

The Lower Tier Project Office (LTPO) manages Air and Missile Defense weapons and related warning systems. These include the PATRIOT Advanced Capability-3 (PAC-3), the Medium Extended Air Defense System (MEADS), and the Joint Tactical Ground Station (JTAGS) programs. The mission of LTPO is to develop, test, field, and sustain air defense systems to defend the lower tier of the Theater Air and Missile Defense (TAMD) architecture. LTPO manages all acquisition life cycle activities for PATRIOT and JTAGS programs. The U.S. MEADS National Product Office, within LTPO, provides oversight for U.S. interests in the international MEADS.
The Joint Attack Munitions Systems (JAMS) Project Office provides service and support as the life cycle manager for the joint warfighter rocket and missile systems.

The mission of the PEO MS Integrated Air & Missile Defense (IAMD) Project Office is to define, develop, acquire, field and sustain the Army's portion of the Joint Integrated Air and Missile Defense (IAMD) system of systems capability to be deployed as integrated components in Army, Joint, Interagency, Intergovernmental and Multi-national (JIIM) Net-centric architectures. Additionally, the IAMD Project Office develops, acquires, fields, and sustains the IAMD Battle Command System (IBCS) component of the architecture and integrates externally developed sensors and shooters to provide an effective IAMD capability.

The CMDS Project Office equips the Air and Missile Defense (AMD) current force with capability in an Integrated Air and Missile Defense System of Systems. CMDS programs include the Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System (JLENS), Sentinel Radar, Surface Launched Advanced Medium Range Air-to-Air Missile (SLAMRAAM), and STINGER-based systems.

CMDS protects the force and selected geopolitical assets from aerial attack, missile attack, and enemy surveillance. CMDS systems also protect the maneuver force and other critical assets against cruise missiles (CMs), unmanned aerial vehicles (UAVs), and rotary wing (RW) and fixed wing (FW) aircraft in the near term and against an expanded threat set, including rocket, artillery and mortar (RAM) projectiles.

The Close Combat Weapon Systems (CCWS) Project Office manages a number of anti-armor missile and target acquisition systems. Current missile systems include TOW 2A, TOW 2B, TOW BB, and the Javelin Missile System. CCWS-managed target acquisition systems include the Improved Target Acquisition System (ITAS). CCWS is also responsible for managing the sustainment efforts of the Bradley TOW 2 Sub-system (T2SS) and Improved Bradley Acquisition Sub-system (IBAS).

The Close Combat Weapon Systems (CCWS) Project Office is an umbrella organization under the PEO M&S, which exercises full-line authority over all planning, direction, and control of tasks and designated associated resources involved in the Javelin Missile System Acquisition Category I (ACATI) and the TOW family of missiles to include the TOW Improved Target Acquisition System (ITAS) and related ancillary items and improvements to these items. This responsibility includes all phases of research and development, procurement, distribution, and logistical support for the purpose of maintaining a balanced program to accomplish the U.S./allied objectives, including international interchangeability and maintainability, and is provided in accordance with the direction and authority from the Army Acquisition Executive. The office is responsible for coordinating all system requirements with field commands, TRADOC, HQDA, OSD, and other government agencies, and for coordinating and implementing programs into the Army's current and future forces.
The next generation in vest body armor uses a single-layered nylon fiber that can offer improved protection at three quarters the weight of most three-ply systems.

Recently chosen over competitors BAE Systems and Point Blank in a U.S. Army SPD-8 down selection, TYR Tactical, a tactical equipment company based in Peoria, AZ, bases its newly-introduced ballistic vest armor product around a developmental fiber composite material called PV500™ Nylon.

“By targeting critical wear areas, PV Nylon offers significant weight reduction while still providing increased performance and structural benefits for load carriage that include reduced system weight, minimal stretch and sag, and improved cut, tear, puncture and wear resistance,” said Jason Beck, president, TYR Tactical.

Influential in the design of TYR’s MST modular body armor system, PV500™ Nylon is the protective ‘skin’ covering reconfigurable soft armor plates and a ballistic vein system that spreads shock vibration from ballistic rounds outward, away from the warfighter's vital body areas. Offered in three configurations, concealable body armor, plate carrier and tactical, the MST system uses scalable soft armor panels in the form of front and rear panels and a building block approach so that a soldier can quickly add additional components to increase armor coverage area and protection levels according to mission requirements or threat environments.

Out of a DoD-wide consensus in the need for lighter weight, greater comfort, and higher protection in warfighter body armor, TYR’s MST system focused on creating a high-threat, maximum coverage, armor configuration. “MST expanded on CBA vest and plate carrier technology in an outer tactical vest by adding ESAPI and ESBII (both stand for?) plates and providing extremity protection for 360° body protection,” said Beck.

To have this ‘full-on’ protection without the accompanying weight, TYR added its one-ply PV500™ Nylon fabric offering greater strength over typical multiple layer Cordura vest fabrics at a quarter of the weight per ounce. “Most vests carry a lot of weight in the interior of the system, much of which is presented by the heavy fabric outer layer,” said Beck. “For us, finding a way to reduce the two and three layers to one without the need to re-design existing armor plate configurations to only disperse the same weight was key. At seven to ten times the abrasion resistance of typical fabrics, PV provided this capability.”

For more info: contact Jason@tyrtactical.com
Interoperability between the U.S. military services and their allies has always been an essential operational requirement. Militaries around the world are basing their information technology (IT) architectures on technology platforms that allow for ease of use, low cost and built-in interoperability, and collaboration features. This allows defense companies to expand development and deployment of military IT solutions that are built on top of the architecture customers have already deployed.

GLOBAL AND SECURE

Since the establishment of our global defense business, I have seen an average of 4-5 militaries per year turn to Microsoft to transform their IT infrastructure. Military forces from the US, UK, NATO and most NATO nations, Australia, and a host of other countries “depend on our technology for their operations.” The dependency is not just restricted to standard Windows Operating System or Office products but an expansion in the use of many of our other products.

Companies like Boldon James, headquartered in the UK, Titus Labs of Canada and Systematic are partnering with Microsoft and seeing effective results. Titus built an application which sits on top of Microsoft Outlook to allow customers to add classification markings.

They’ve added our Right Management Services software to create a valuable military messaging environment. Rights management applications give warfighters a greater ability to control the message they are transmitting by encrypting it in such a way that only message addressees who receive the message can read it.

SHARING THE DATA

In all areas of military operations, managing systems, people and information is everything. The ability to combine data from different levels of tactical operations and connect disparate systems and personnel helps leaders to communicate with frontline commanders. It also makes full use of all available information.

Microsoft SharePoint collaboration software has become a standard solution for many military operational requirements. General David Petraeus, current commander of U.S. forces in Afghanistan, visited Microsoft last year and told us he considers SharePoint to be a key command and control solution for the military. The military is finding ways of taking advantage of SharePoint capabilities to reduce the time and effort needed to coordinate and share critical data.

Several years ago, Microsoft assisted the U.S. Department of Defense in developing a command center solely focused on IED data collected from the Iraq and Afghanistan theaters of war. It uses SharePoint and other Microsoft product applications to analyze all known IED information and support deployed forces through a variety of operational networks.

PDA-READY

Linking these military messaging systems to PDAs is also becoming an important aspect of today’s modern military communications system. The Battlefield Medical Information System – Tactical (BMIS-T) is a great example. Using a hand-held device, medics can insert a soldier’s digital dog-tags, see the medical history stored there on a chip, make changes based on observed symptoms, and pass this information via the mobile secure network to medical triage sites along pre-planned evacuation routes.

ON A CLOUD

Network operations needs across the military have led to a drive for increased cloud computing capabilities to support information data storage.

MS is using almost every software product we build to help the military achieve situational awareness and enable battlefield commanders to improve command and control of the fight. As we turn more and more to cloud computing technologies, I see a future where data centers are mobile and deployed to crisis locations. Soon soldiers will reach into the “cloud” using hand-held devices to have the information they need, when they need it, at their fingertips.
Today’s warfighters must be able to communicate in the most rugged and isolated terrain to perform their critical missions. Where traditional communications systems can fail, ITT’s RO tactical radio prevails. With a robust push-to-talk handheld transceiver offering secure, over-the-horizon satellite-based voice and data communications, the RO radio enables mounted and dismounted forces to communicate successfully in even the harshest environments. For more information on this new innovation, visit communications.itt.com/ro.

The sky is not the limit for our tactical communication systems...it’s just the beginning.

ITT

Engineered for life
### Heavy Cargo Tactical Trailers

Silver Eagle Manufacturing Company will build 48 of its Fifth Wheel Tactical Trailers (FTT) to be used for deployable systems equipment.

Designed and manufactured exclusively by Silver Eagle, the FTT trailer allows an increase in HMMWV towing capacity by 67% to 7,000 lbs., allowing FTT to move shelters and other mission critical cargo and systems without weight waivers or repackaging. Even heavier, up-armored HMMWVs can accommodate the movement, including the S-250, S-788 LMS and GSS-1497, when utilizing the system.

The FTT Fifth Wheel design attaches the trailer to the bed of the HMMWW, placing the weight of the trailer over the vehicle’s rear axle. An advanced suspension design and patent-pending coupling system allows for easy maneuverability and an improved turning radius.

For more info: www.silvereaglemfg.com

### Dual Port Capability Amplifiers and Radio Agnostic SATCOM

AMTI, an Ultralife Communications Systems brand, has introduced a simple, clip-on attachment for the A-320 20-watt amplifier that provides both Dual Port Adapter (DPA) and Low Noise Amplifier (LNA) capabilities. The lightweight unit clips on to the existing lanyard pins and is removed just as easily.

The A-320DPA retrofits to the thousands of A-320 amplifiers currently in service and provides future users with the option of adding DPA when the mission requires. The DNA also functions as a Low Noise Amplifier (LNA) for UHF SATCOM operation.

Supporting DAMA and JTRS waveforms and JITC certified for HAVEQUICK and SINCGARS, the amplifier is offered stand alone or in packaged formats such as the A-320KT Total Solutions Kit.

For more info: www.ulbi.com

### On-Board Vehicle Power System

DRS Technologies has developed an On-Board Vehicle Power (OBVP) system configurable as a factory or depot retro-fitted kit featuring a Transmission-Integral Generator (TIG) with no impact to drive-train length. The system offers on-the-move power available to support enhanced operations in current and future force vehicles, eliminating the need for traditional towed generators in an expeditionary force.

OBVP may be used to provide expeditionary power for a tactical operations center (TOC), expeditionary field hospital, or other energy-dense systems, providing for increased mission capabilities, power during idle/stationary mode, high and/or low voltage, AC or DC, no additional belts, bearings or shafts, safety from catastrophic vehicle failure, and diagnostics and operational data reported.

For more info: www.drs.com

### Solar-powered UAS

The Boeing Corporation has won a contract to build a solar-powered flying wing unmanned aerial vehicle (UAV) intended to stay aloft for five years at a time under DARPA’s Vulture program. The first test of the Phantom Works prototype will be to fly the UAV, Boeing’s Solar Eagle, for 30 days on solar-electric power. “Our plan is to go for much longer than that,” said Darryl Davis, president, Phantom Works.

The Solar Eagle and its more than 122m (400ft) long wing will eventually be expected to fly for more than five years at a time at heights of 60,000-90,000ft carrying a 450kg (1,000 lb) payload with minimum on-board power of 5kW/h.

The $155 million second phase of Vulture lists the “stretch goals” for Phase II as being able to carry a 90kg payload with 1kW/h of power with 99% reliability on a 90-day test flight. Phase II will also include risk reduction efforts for the UAV’s systems and design and construction of a full-scale demonstrator. “The program will conclude with a flight experiment of a near full-scale demonstrator,” said DARPA officials.

Boeing’s partners include Versa Power Systems, Draper Laboratories and Qinetiq.

For more info: www.boeing.com

### SATCOM on-the-Move

The MIK-21-75 SOTM System is a complete vehicle solution designed for conducting secure broadband (UHF, LOS and SOTM) including satellite communications. It is designed specifically for adaptation and installation in High Mobility Wheeled Vehicles (HMMWV).

The MIK-21-75 now works with any of the manpack radios currently available in the 30-512 MHz frequency range.

The system easily integrates into most military vehicles. Installation is made easier because the MIK-21-75 features adaptable mounts and is pre-wired for quick connectivity. A SATCOM antenna mounting bracket is also included for easy mounting into the vehicle. The system operates with a wide range of DC input voltages and includes a 50-watt amplifier.

The system integrates amplified audio (MRC-67A Amplified Speaker), radio power and power distribution.

For more info: www.ulbi.com
FutureTech

**Height Adjustable Cargo Restraint Nets**

Networks Enterprises, Inc., a U.S. based company located in New Hudson, MI, manufactures and distributes multiple patented LoadTamer® Height Adjustable Cargo Restraint Nets and related hardware currently in use by all branches of the U.S. military, DoD agencies and many allies. LoadTamer® is designed for commercial, tactical wheeled, MRAP/MATV, combat vehicles, ATV’s, trailers, milvans, Zodiacs, helicopters, ISU 90’s and all hard wall shelters which require internal restraint.

LoadTamer® Solar Shield is used to mitigate solar loading on vehicles and shelters (currently being used on combat/wheeled vehicles & shelters). Interior temperatures are reduced by as much as 60° + F allowing the ICU’s to function properly, reach life cycle and reduce fuel consumption by 15% (U.S. Army environmentally tested).

LoadTamer® Rope Locks, used on a variety of Army/USMC small/medium and large tents, securely hold the wind lines with no slippage even in high winds (NATICK tested & approved). These Rope Locks have been used by DRASH and Hunter Defense (Base-X) for over seven years.

For more info: www.cargonets.com

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**Enhanced Voice and Data for Ground Vehicles**

BAE Systems has received a $120 million contract to equip up to 400 U.S. Air Force ground vehicles as part of the tactical air control party modernization (TACP-M) program, with improved voice and data communications. These capabilities will enable Air Force tactical air controllers to advise ground commanders and coordinate aircraft operations.

Under the contract, BAE Systems will design, produce, and install the TACP-M’s vehicular communications system (VCS) with the Tactical Command Industries’ (TCI) Liberator III headset and the headset system designated for the program.

“TCI’s Liberator III headsets will augment the capabilities of VCS and incorporate high-performance digital hearing protection, situational awareness enhancement and multi-comm functionality for TACP’s using VCS,” said Don Medine, president, TCI.

The VCS will provide mobile voice and data communications for TACP-M. The purpose of the program is to advise ground commanders and staff on aerospace power capabilities and assist in planning close-air-support operations using vehicle-mounted digital comms, man-pack radios, and devices.

For more info: Don Medine at don.medine@tacticalcommand.com

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**Armor Solution Protects Against EFPs**

Battelle, working with Plasan, a supplier of survivability solutions that have been implemented on key DoD armored vehicle programs, has created and tested a vehicle armor solution for the prevention of injuries caused by explosively-formed penetrators (EFPs). Two EFP solutions that Battelle co-invented were validated at Aberdeen Proving Ground. The armor will be made available for military program managers to incorporate into their platforms.

Much of the EFP (and other armor) testing occurs at Battelle’s High Energy Research Laboratory (HERLA) in West Jefferson, Ohio, while the design, materials development, modeling and integration occurs at additional sites. Battelle has a Tier 1 and Tier 2 rating under the EFP Surrogate Warhead Program and has been approved by the Joint IED Defeat Test Board to conduct private testing of armor solutions under certified U.S. Army standards using Army Research Laboratory surrogate devices.

For more info: Katy Delaney at delaneyk@battelle.org

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**Tiger Light Armored Vehicle Team**

Textron Marine & Land Systems has announced a teaming agreement to market, design and manufacture the Tiger light protected vehicle.

Based on a commercial off-the-shelf (COTS) Dodge® RAM® 5500 platform, the Tiger is a ballistic and mine blast protected all-terrain armored vehicle for a crew of six to nine with a spacious, versatile cabin and large payload capacity to meet mission requirements.

With a powerful Cummins® 350 HP diesel engine and a 127-inch wheel base, Tiger offers an advanced suspension system and an 8.8 ton GWR, with a standard armor package, allowing for a 1.5 ton payload capacity. A roof mounted remote controlled weapon station, or man-operated turret are optional.

For more info: www.textron systems.com

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www.tacticaldefensemedia.com Armor & Mobility November 2010 | 25
USMC LAV: Enhancing Survivability and Lethality

The U.S. Marine Corps is implementing sweeping efforts to modernize its fleet of tried and true light armored vehicles (LAVs) in meeting operational transformation objectives.

By Chad Samuels

The LAV Program Office has fielded numerous upgrades for the family of LAVs. All variants of the family of LAVs are in the A2 configuration, identified by appliqué armor, spall liner, fuel injectors and radiator for increased engine power, an increased alternator to support more electrical equipment, Generation 2 suspension to handle the increased weight of the appliqué armor and automated fire suppression system for improved crew and vehicle survivability. The Program Office is also fielding an upgraded Command and Control variant to replace existing radios with more capable systems, add auxiliary power and provide network linked laptops for improved situational awareness and fire control. The command and control (C2) upgrade program is being fielded to operational units.
As the key element of the light armored reconnaissance (LAR) battalion, the LAV's role in USMC maneuver warfare requires that the vehicle maintain its mobility and agility performance (as well as transportability) while being upgraded to meet the evolving threats. As such, each potential upgrade or addition requires a trade study to determine the impact on this performance profile. As an example, the analysis for the addition of the upgraded armor package showed that automotive performance could be maintained with the increased weight with some minor modifications to the power train.

“The LAV size, weight, power, and performance envelopes are basically established areas in which trades must be made,” said Dr. Bob Lusardi, Marine Corps Systems Command’s Deputy Program Manager of Light Armored Vehicles. “Besides effecting performance, weight and size can limit transportability options which are needed to meet the expeditionary requires of the Marine Corps. So upgrades and modifications must be considered within the allowable trade space of these envelops.”

**Off-Road Survivability**

In the past, wheeled combat vehicles were designed around mission profiles which had an equally balanced distribution of paved road, secondary road, and cross-country travel. Hence suspensions where designed to those requirements. As we have seen in the last few years, scenarios such as encountered in OIF and OEF require a higher proportion of rugged, off-road travel. This requires suspensions with greater wheel travel and better dynamic response capabilities.

“The two keys capabilities to be addressed are the value of increased off-road performance and improved standoff from underbelly blasts,” said Lusardi. “We know that increased standoff between a mine and the vehicle improves survivability. Balancing that higher ride height against the impact on vehicle dynamics is an engineering challenge that can be addressed using variable height suspensions,” he added.

The LAV driver’s protection kit consists of ballistic blankets, vehicle commander (VC) and gunner blast shields and height adjustable removable machine (HARM) gun mounts, being fielded to improve survivability and lethality. Ongoing LAV survivability enhancements (Survivability II) include fuel cell protection, ballistic seats and additional internal spall protection.

An improvement in situational awareness for the LAV-25 was added with the new thermal sight system. This added significant range to the system. A number of different systems have been added to the platforms in theater, such as a Blue Force Tracker (BFT). “We are continually evaluating new additions in this area as technology continues to improve. Our desired end-state is to have the platform which is open enough to accept a variety of subsystems that can be added or removed as the mission dictates,” Lusardi added.

**Improved Ride**

The U.S. Marine Corps is currently in the second phase of a contract with MillenWorks, Textron Marine & Land Systems, under contract with General Dynamics Land Systems, valued at $2.1M for the development, integration and performance testing of suspension enhancements for all variants of its Light Armored Vehicle (LAV) platform. Scheduled for completion in January 2011, the improvements are intended to restore payload capability and improve performance.

Built with metallic front and rear springs, the legacy LAV suspension system uses passive damping at all wheel stations. Because of these characteristics, vehicle ride is not adjustable to meet differences in payload or terrain. To remedy this, MillenWorks is using a derivative of the Magneto-Rheological (MR) active damper suspension design developed for the Army’s Stryker platform. Originally designed to operate with a curb weight of 28,000 pounds, today’s USMC LAV platform variants are exceeding the 32,000 pound range, and are still climbing due to increasing requirements.

“With the replacement of the passive coil system with an MR active damping system including a gas spring as part of both the front and rear suspensions, LAV operators will now have variable control over the vehicle’s ride, much like their Stryker operator counterparts,” said LeNoach.

In addition to an active damping system, MillenWorks is adding several other system upgrades to the LAV such as a compressed gas ride height management system, new wheel ends, half shafts, and new control and trailing arms.

In contrast to Stryker, LAV variants are not equipped with centralized control systems for vehicle diagnostics. As part of the the proposed upgrade, the MillenWorks is offering a new integrated electronic user interface that will enable vehicle operators to control key platform systems from the cockpit. The interface will allow control of the new active damping suspension system, tire inflation, anti-lock braking as well as other primary electrical and mechanical features.

“Centralizing the tire inflation capability for LAV operators is a major improvement over past manual inflation procedures,” said LeNoach. “Operators will be able to control air pressure levels on the fly, at the push of a button, without sacrificing personal safety or mission progress.”

Integration to the demonstration vehicle is currently wrapping up and performance testing is scheduled for CY Q4, but improvements to ride and handling (as predicted through modeling and simulation) are expected to closely mirror those of Stryker.
**Command and Control Variant**

The contract to produce 52 upgraded LAV C2 platforms was awarded to Lockheed Martin in December 2009. The legacy LAV C2 platforms are provided to Lockheed Martin by the U.S. Marine Corps. Equipment integrated by Lockheed Martin includes an advanced communications suite, improved automated workstations and command systems. Production is currently planned to be completed over the next two years.

“The upgraded LAV-C2 is a transportable, agile and amphibious armored platform that provides the Marine Corp cutting-edge communication and connectivity,” said Scott Greene, vice president, Vehicle Systems, Lockheed Martin Missiles & Fire Control. “This upgraded system seamlessly integrates all means of communication, UHF, VHF, HF, SATCOM, Voice and Data into one centralized platform that can be forward deployed with maneuver units; providing more flexibility, responsiveness, and control of the Marine Air Ground Task Force, artillery, intelligence and other support missions.”

**Modernizing for Mission**

In addition to survivability, PM-LAV is also developing improvements for the LAV-AT Modernization (ATM) Program and LAV-R Upgrade Program. Both programs are aimed at improving the supportability and mission effectiveness of the family of LAVs by providing “mission suite upgrades” to their variant specific “mission suites”. In addition to improving overall reliability, availability, and maintainability of the mission suite, the Anti-Tank program will provide a second generation thermal sight and an advanced fire control system capable of firing the current and next generation heavy anti-armor missile. The LAV-R upgrade will provide a more modern crane, winch, and generator on LAV Recovery vehicles giving the fleet greater lifting and pulling capability.

The next planned fleet wide survivability upgrade (Survivability III) will address improving mobility and agility while creating the capability for new protection solutions to be integrated on the platform. This will include an upgraded suspension as well as looking at ways to save weight. This effort is planned to start in FY12.

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BAE Systems received a contract modification for up to $70 million to supply Vehicle Emergency Escape (VEE) Windows (VEE) for new production M1151 High Mobility Multipurpose Wheeled Vehicles (HMMWV).

This contract raises the total number of orders for VEE Windows to more than 39,000 with more than 16,000 kits already shipped for the up-armored M1114 and M1151 HMMWVs. The VEE WindowTM is part of the Army’s Fragmentation Kit Seven, which is a set of survivability upgrades to already fielded M1151 HMMWVs. In addition, BAE Systems is adapting the VEE Window technology to other tactical up-armored combat vehicles.

The VEE Window is a critical tool for enhancing the safety of crews riding in up-armored vehicles in dangerous combat zones where rollovers and accidents are a significant threat. The U.S. Army tested and approved VEE Window is a low-cost, life-saving enhancement and is easy to use and adaptable to virtually any tactical up-armored combat vehicle. The VEE Window meets current M1114 ballistic properties and is easily installed by unit maintenance personnel in theatre. VEE Windows are applicable for other tactical armored vehicles, including HMMWVs, Family of Medium Tactical Vehicles (FMTV), Medium Tactical Vehicle Replacement (MTVR), Mine Resistant Ambush Protected (MRAP) vehicles and Joint Light Tactical Vehicles (JLTV).

The VEE Window kit modifies the existing transparent armor assemblies (ballistic windshields) to add an emergency exit point, making it a cost-effective safety enhancement for the M1114 HMMWW. With only two moving parts, the VEE Window requires minimum maintenance and very low life-cycle cost.

“This new contract modification is a testament to the relationship we have developed with AM General,” said Jill Theiss, VEE Windows program manager. “With our on-time delivery record and breakthrough technology advances, we serve as a top industry leader for this life-saving solution.”

The patent pending VEE Window kit is part of BAE Systems’ robust Readiness and Sustainment capabilities and features a simple, intuitive design that enables soldiers to quickly exit the vehicle in case of an emergency. The front ballistic windshield can be easily released and pushed out, allowing soldiers to exit the vehicle in only seconds. With few moving parts, the VEE Window requires minimum maintenance, a very low life-cycle cost and can be installed in the field by trained Army and Marine maintenance crews.

**Kitting**

The kit for the M1114 and M1151 HMMWV consists of modified transparent armor assemblies or bullet-proof windshields, with integral, fail-safe latch mechanisms. The kit provides the same level of ballistic protection as the current vehicle configuration but with the added latch feature allowing passengers to rapidly escape during an emergency. The rotary latch mechanism has integral safety interlocks, is easy to operate and the process for releasing the window takes less than five seconds. In the event of a vehicle emergency, a crew member simply pulls out the locking pins, turns the two latches and pushes the window out allowing the crew to quickly evacuate the vehicle.

**Ahead**

BAE Systems was originally awarded this contract from AM General in August 2009. The company has partnered with Ibis Tek LLC for the design and manufacture of VEE Windows since 2006. BAE Systems offers survivability system, design, development and integration expertise. Ibis Tek brings experience in the design and manufacture of transparent armor solutions. “Our extensive in-house capabilities and customer commitment have been critical to the success of this program,” states David Damits, Ibis Tek program manager.

Work on the VEE Window will begin immediately at BAE Systems and industrial partner facilities in Minneapolis, Minnesota and Butler, Pennsylvania. The work is anticipated to be complete in March 2011.

For more info: visit www.baesystems.com.
In 2003, the Space and Naval Warfare Systems Center Pacific (SSCPAC), San Diego, CA, expanded their autonomous unmanned-ground-vehicle focus to include unmanned surface vehicles (USVs). Their initial foray into this new application domain was jump started by adapting baseline autonomy and command-and-control software from 20-plus years of experience in ground systems for the U.S. Army and Marine Corps. This adaptation of existing modular software allowed the lab to demonstrate basic GPS waypoint navigation almost immediately, after which the same approach was employed to harvest more advanced algorithms for autonomous obstacle avoidance.

According to project manager Mike Bruch, one of three Section Heads in the Center’s Unmanned Systems Branch, “This initial obstacle-avoidance software worked very well on the USV but needed to be augmented with maritime-specific sensors and planning algorithms.” To fill that gap, Bruch’s team imported the Navy’s Digital Nautical Charts into the autonomy software as the baseline world model, then added a path planner with a custom Automated Radar Plotting Aid (ARPA) and standard Automatic Identification System (AIS). “We also added additional obstacle-avoidance sensors, such as a wide-baseline stereo vision system and a 360-degree lidar,” continued Bruch, “along with algorithms that mimic the nautical rules of the road.

“A two-tiered obstacle-avoidance approach was adopted, consisting of a near-field or reactive component and a far-field or deliberative component that operate simultaneously and in conjunction with one another,” said Jacoby Larson, lead engineer on the USV effort. The primary function of the
deliberative component is to continuously modify the existing waypoint route to plan around obstacles detected with the long-range sensors. The reactive component is responsible for avoiding obstacles in close proximity to the vessel, regardless of the mode of operation or current mission.

Advanced Technology (CCAT), which is funded by the Office of Naval Research (ONR). “This evolutionary-upgrade approach has also allowed us to harvest valuable technology components from both academia and industry, including non-traditional vendors. In this particular case, for example, we have two of the most advanced USV technology-demonstration platforms out there, with very little cost incurred by the Navy.

CUSV

AAI, in partnership with Maritime Applied Physics Corporation, developed the Common Unmanned Surface Vessel (CUSV) as a prototype using its own internal resources, with the goal of providing the U.S. Navy a flexible, multi-mission capability that could be brought to the fleet quickly. Spiral upgrades will continue on the CUSV in anticipation of a potential program of record by the Navy for such a capability, which might be expected in 2011 or 2012.

“We made the choice to procure and integrate the Navy’s data link selection — the SeaLancet RT-1944 — into our CUSV system for a more seamless user experience,” said Ryan Hazlett, Program Director, Advanced Systems, AAI Textron. “In addition, the RT-1944-equipped CUSV is integrated with AAI’s Universal Ground Control Station, a NATO Standardization Agreement 4586 and Joint Architecture for Unmanned Systems compliant system based on our proven One System® command and control technology. Together, these enable the CUSV to deliver line-of-sight communications at demonstrated lengths up to 12 nautical miles,” he added.

Within the next year, AAI Textron intends to integrate satellite communications capability with the CUSV to provide over-the-horizon communications. In addition, we intend to enable our CUSV to interoperate with AAI’s unmanned aircraft platforms, which would act as a communications relay link between the Universal Ground Control Station and the CUSV for over-the-horizon communication capability. “This flexibility would allow customers to make use of the CUSV across their concepts of operations,” Hazlett noted.

“In addition, the CUSV has a built-in intelligence, surveillance and reconnaissance (ISR) package, so no matter what kind of mission payload package has been loaded into the payload bay, users still benefit from persistent ISR simultaneously,” said Hazlett. “We also have received interest in arming the CUSV, and it does have the ability to accept weapon systems.”

LCS

The Navy designed its Littoral Combat Ship (LCS) with modularity in mind, and we kept that goal at the forefront of our CUSV development. The CUSV’s payload bay can accommodate a large variety of mission payload packages including mine hunting, anti-submarine warfare or mine countermeasures, as well as carry equipment such as SONAR buoys and small or micro-unmanned underwater vehicles.

Interestingly, the original goal of the Unmanned Systems Branch was not to develop a sophisticated autonomous USV per se, but to provide appropriate test platforms for porting their Multi-robot Operator Control Unit (MOCU) from the UGV to USV domain. According to project engineer Ryan Halterman, “The modularity of our existing autonomy and operator-control-unit software allowed this new USV effort to reach an impressive level of maturity in a fraction of the time required had it begun from scratch. MOCU is now used on the Navy’s Littoral Combat Ship (LCS) as the common USV operator interface for both the Anti-Submarine Warfare and Mine Warfare Mission Modules.”

In terms of transportability, we believe that incorporating the CUSV with the LCS has the potential to reduce total ownership cost, including training and logistics, because the common platform would reduce the amount of equipment going in and out of dock. Instead of having to dock every time a new mission is assigned in order to swap payload packages and mission equipment, the modular nature of the CUSV’s payload bay would allow the next mission package to be loaded quickly from the LCS.

“We don’t see unmanned surface vessels like the CUSV being in competition with manned and unmanned aircraft; instead, we envision them as highly complementary as part of a comprehensive concept of operations for land, sea and air,” said Hazlett. “Unmanned platforms like the CUSV and unmanned aircraft offer the flexibility to take on the ‘dull, dirty and dangerous’ tasks that might ordinarily be assigned to manned assets. For example, airborne or maritime manned assets might be assigned to execute long, time-consuming patterns for potentially dangerous missions such as minesweeping. An unmanned platform like our CUSV pulls sailors out of harm’s way to take over those laborious tasks, freeing them to execute the missions that are better suited to manned platforms.”

In a complementary concept of operations, an unmanned aircraft could be engaged to provide persistent overhead ISR, while the CUSV would be launched to provide sea-based ISR with its distinct advantages of more autonomous operation and the ability to cover long distances from the main ship. Both would be able to transmit critical data and imagery back to that ship for a comprehensive operational picture.

For more info: visit www.spawar/navy/mil

www.tacticaldefensemedia.com
Satellite communications can provide support for all comms-related requirements independent of any forward deployed resources. This is critical when operations are taking place in regions with no or limited existing infrastructure to utilize.

“Satellite on the Move (SOTM) is really the key to communications in the ‘non-linear battlefield’ of today’s operations,” said Susan Miller, CEO of Spacenet Integrated Government Solutions, Gilat Network Solutions.

While there are a variety of great technologies to support SATCOM, low profile mobile platforms offer some very distinct advantages. For instance, a low profile antenna is nearly flush with the vehicle’s roof which maintains vehicle mobility, agility, stability and aerodynamics. Also, the low profile antenna facilitates air drop of equipped vehicles and does not interfere with 360 degree gun turret rotation. More importantly, it minimizes the signature of the equipped vehicle and avoids marking it as a “high-value” target for enemy attack, protecting the safety of the teams operating the equipment.

“Beyond the form factor, it’s critical that the equipment is easy to operate, all weather capable, and able to transmit at high rates to support all user requirements,” noted Miller. “The further evolution of SOTM antennas will enable transmission over multiple bandwidths (Ku, Ka, X band etc.), higher data rates and smaller solutions.”

As DoD services continue to increase usage of tactical satellite (TACSAT) terminals, there are insufficient channels to support user requests. While aging satellites continue to degrade, an alternative is needed to support requests until DoD’s Mobile User Objective System (MUOS) becomes available. Thales Communications Inc., headquartered in Clarksburg, Maryland, is developing an integrated lightweight solution to address these concerns.

“SATCOM IW, the integrated waveform, will allow more users space and time on channels while improving both voice and data quality,” said Walt Hepker, vice president, business development, Thales Communications. “SATCOM IW (MIL-STD-188-181C, -182B, -183B), an enhanced method of multiplexing radios on the same channel, is the replacement to Demand Assigned Multiple Access (DAMA) SATCOM.”

Thales Communications’ AN/PRC-148 JTRS Enhanced Multiband Inter/Intra Team Radio, or JEM, is the only handheld radio currently available to support SATCOM IW. Using currently fielded AN/PRC-148 JEM radios, users will be able, via software download, to access SATCOM IW, further distributing SATCOM capability across the battlefield.

“This new waveform capability will be transparent to the warfighter and has a minimum impact to fielded radios,” said Hepker. “With SATCOM IW, the AN/PRC-148 JEM will provide enhance capabilities of the dismounted warfighter as recent tests have proved successful in utilizing the radios in vehicle configurations for SATCOM on the Move (OTM) capability.”

Beneficially, SATCOM IW doubles the capacity for communications services and increases data throughput capacity over legacy DAMA. Voice communications quality is improved through inclusion of Mixed Excitation Linear Prediction (MELP) voice encoding, and overall usability is improved through a more intuitive human-machine interface. The AN/PRC-148 is currently undergoing JITC testing for SATCOM IW and Thales anticipates availability of this waveform by the end of the year.

Managing the Network

Various commercial satellite solutions are in current trial for military application and are providing in-theater systems with a variety of defense organizations. At the center of SATCOM network hardware is the antenna
Hughes recently introduced the HX ExpertNMS, a network management system with an easily operated user interface. ExpertNMS is a full-featured capability of the commercially successful HX System employing an intuitive graphical user interface to an advanced set of monitoring and diagnostic features, enabling efficient management and optimization of network performance.

“The ExpertNMS can help a warfighter in theater set up a satellite broadband network in a remote location with relative ease,” said Rick Lober, Vice President and General Manager of Hughes Defense and Intelligence Systems Division. “The technology utilizes an installation wizard with step-by-step setup instructions and provides a dashboard that easily shows network health, enabling quick evaluation of the HX System with a diagnostics tool that allows a user to immediately identify and address any problems or bandwidth issues.”

Network routers also enable on-the-move capability, allowing military operations to maintain secure communications (voice, video and data) in joint and fixed environments. Hughes’ latest HX router, the HX280, has FIPS 140-2 certification and enhanced signaling security, which protects all data, management, and signaling traffic over the satellite network. The HX series is capable of vehicular, shipboard and airborne on the move applications – all through the use of the same terminal type. The Australian Department of Defence recently completed a successful test of the HX System in a land mobile simulation.

Hughes is also testing a new antenna security modulation developed for commercial industry called Scrabbled Code Multiple Access (SCMA) and is making it available to military markets requiring very small antennas. Initial SCMA applications will have 128 kbps throughput using a cost-efficient 9-inch diameter Ku-band antenna for on-the-move application. Currently undergoing Wideband Global SATCOM (WGS) certification, Hughes is preparing to launch its second satellite, Jupiter, in 2012, a high-throughput satellite system that will provide over 100 Gbps multi-beam, bent pipe Ka-band with global coverage.
The U.S. Army’s First Army component is transitioning its headquarters to Rock Island Arsenal, Rock Island, Illinois to meet service goals for National Guard, Reserve and Department of the Army training and deployment mission requirements.

Submitted by First Army Public Affairs

U.S. First Army mobilizes, trains, and deploys all Army National Guard and U.S. Army Reserve forces throughout the continental United States and two territories providing trained and ready forces for diverse missions worldwide. Located at Fort Gillem in Forest Park, GA, a suburb of Atlanta, First Army headquarters employs more than 200 active duty, Army National Guard and Army Reserve soldiers, and almost 200 Department of the Army civilians and contractors. The headquarters is scheduled to relocate to Rock Island Arsenal, IL in 2011.

Q: Please provide some brief background regarding the BRAC recommendation to move First Army to Rock Island Arsenal.

A: Based on the 2005 BRAC committee’s recommendations, First Army has been planning and making preparations for the movement of its headquarters. This includes numerous site visits to RIA to receive updates on the progress of the headquarters building renovation, visits with the garrison and other tenant units to discuss issues that are specific to the area, and visits to Fort Gillem from RIA representatives to discuss issues of importance including housing, educational opportunities, and medical facilities.

We continue to work closely with both our workforce and the communities near Fort Gillem and Rock Island Arsenal to make the transition as smooth as possible for our soldiers, civilians and their families while remaining focused on our core mission; mobilizing, training, and deploying reserve component forces to meet combatant commander requirements.

Q: Briefly describe First Army’s organization and the impact of BRAC 2005.

A: First Army comprises a headquarters, two division headquarters (Division East at Fort Meade, Md and Division West at Fort Hood, TX), 16 training support brigades (TSBs) and 103 training support battalions (TSBns) located throughout the continental United States (CONUS).

Only the headquarters element at Ft. Gillem is affected; operations at our other locations are unaffected by the BRAC 2005 directive.

Since 2008, First Army has undergone a rigorous transformation and reorganization. As a result, First Army has concentrated its TSBs at six Mobilization Training Centers (MTCs): Fort Lewis, WA; Fort Bliss, TX; Fort Hood, TX; Camp Shelby, MS; Camp Atterbury, IN; and Fort Dix, NJ.

Q: How will the relocation of First Army to Rock Island Arsenal (RIA) affect the organization’s mission?

A: First Army’s mission is to mobilize, train, and deploy all CONUS-based Army National Guard and U.S. Army Reserve forces mobilizing and deploying in support of operations around the world. The movement of the headquarters to RIA will not alter that mission. This year, First Army is training nearly 70,000 soldiers, sailors, airmen, and civilians across a broad set of mission requirements ranging from Operation New Dawn in Iraq (OND), Operation Enduring Freedom in Afghanistan (OEF), Kosovo Force (KFOR), Joint Task Force-B in Honduras, the Multi-National Force Observers in Egypt (MNFO), the Horn of Africa (HOA), Guantanamo (GTMO), and Operation Unified Response in Haiti (OUR), and this will remain the mission of our headquarters as we relocate to RIA in 2011.

Q: What will be the impact on RIA of having First Army Headquarters as a major tenant unit?

A: RIA, as part of the BRAC directive, is giving up, in terms of numbers of people, slightly more than it is getting, but the community is genuinely excited about welcoming First Army onto the arsenal and welcoming our families into the local communities. The practical impact, from our perspective, is that First Army brings to RIA a mission they are not currently familiar with: training soldiers for combat. First Army has many years of experience at performing this mission and does this as well as anyone in uniform.

For more info: visit www.first.army.mil
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Letterkenny Army Depot (LEAD) is responsible for providing with depot-level maintenance support and “capabilities-based” worldwide logistics that is reliable, timely and cost-effective.

Originally established as an ammunition depot, Letterkenny Army Depot (LEAD) is known as the Army’s capabilities-based depot. Comprising over 18,000 acres, the depot is the largest employer in Franklin County, Pennsylvania with 3,647 employees and funnels over a quarter of a million dollars annually into the region through payroll and contracts.

The depot’s focus is to provide DoD capabilities-based logistics support to the joint warfighter that includes the full spectrum of program management, depot-level maintenance, manufacturing, sustainment, field-level support of weapons systems, soldier systems, and munitions and missiles.

Letterkenny is subordinate to the U.S. Army Aviation and Missile Life Cycle Management Command, which is subordinate to the U.S. Army Material Command. The depot mentality of always being flexible, ready and relevant to each new obstacle and challenge remains the same even as the workload continues to be ever-changing. The mission is to provide the highest quality product in the most cost-effective and timely fashion. LEAD strives for a rapid turnover rate producing projects at record-breaking schedules to enhance soldier safety and contribute significantly to the warfighter.

**Route Clearance**

LEAD was recently named the Joint Depot Source of Repair Decision on the Route Clearance Vehicles (RCV). The services jointly agreed that depot maintenance will be accomplished organically for the RCV: Buffalo/ MPCV, Vehicle Mounted Mine Detection System (VMMD) also known as the “Husky,” RG-31 Medium Mine Protected Vehicle (MMPV), Joint EOD Rapid Response Vehicle (JERRV) and Medium Mine-Protected Vehicle (MMPV) Panther at LEAD.

The Buffalo/MPCV is a mine-hunter clearance system, which provides a mine blast secure platform for soldiers engaged in the search for personnel mines and higher-rated improvised explosive devices along roadways. The MPCV clears the path for safe movement of troops, supplies and commercial traffic. The Buffalo is the key weapon in establishing confidence and stability in areas of operation.

The VMMD or “Husky” System comprises two multiple vehicles and a mine detonation trailer set that operates as a single mine detection and detonation system. The VMMD provides a blast-protected platform for the operator and detects and marks large metallic mines, and suspected large metallic explosive hazards such as AT mines and IEDs.

RG 31 MMPV provides a blast-protected platform to protect soldiers conducting route clearance missions in order to assure mobility of the force.

MMPV Panther supplies explosive hazard teams as well as explosive ordnance disposal (EOD) engineers with an ambush protected command and control platform that protects and transports soldiers supporting route clearance operations.
The JERRV’s primary role is to support first responders such as Army “89D” Explosive Ordnance Disposal Specialist in neutralizing Improvised Ordnance Disposal Devices (IED), mines and other ordnance. Projects such as converting the MRAP CAT II Cougars into JERRV produce the most protective vehicles equipped with overall armor protection and a V-shaped hull.

Recently, LEAD employees were commended for successful completion of a JERRV conversion mission. Tasked by the Program Manager-Assured Mobility Systems (PM-AMS) to convert 25 Marine Corps Cougar vehicles to Army JERRV vehicles, LEAD employees completed the task in a tight turnaround timeframe. Work was commenced mid April 2010 with the last vehicle shipped from the depot on July 7, 2010, to Charleston, SC for direct shipment to warfighters in Afghanistan. Many employees sacrificed personal time with family and worked tirelessly seven days a week, 12-14 hours a day, for 60 days or more to ensure mission success.

Even though the RCV workload has just become a central part of the mission at the depot, it is not unfamiliar with maintenance on RCV. In 2007, PM-AMS requested that Letterkenny establish a Route Clearance Fleet Modernization Activity (RCFMA) in Kuwait to repair and modernize Army and Marine Corp RCVs along with selected USMC and Army MRAP assets. The mission was projected to last three years, beginning in October 2008. A 179-day rotation was implemented for 13 LEAD government staff personnel positions and the rest of the team was comprised of an estimated 300 personnel of third country nationals.

The RCFMA was managed by LEAD and operated by a contractor, VSE Corporation. Tasks included repairing the vehicles to Condition Code B or TM 10/20 standards, installing upgrades, installing modification work orders, completing de-rusting, priming and painting, restoring ballistic hull integrity, and updating vehicle records to reflect upgrades. The contractor also processed selected RCV vehicles for retrograde to CONUS.

The workload at the depot rapidly changes in order to meet the demands of the soldiers in theater. The emergence of RCV vehicles has shifted the primary focus of the depot’s vehicle workload. By 2012 or 2013, the depot looks to add approximately 200 additional jobs to help complete the mission.

The depot got an early start in the area of air defense and missile maintenance. Since the late 1950’s, Letterkenny has been actively involved in missile maintenance. Projects first began on the NIKE missile system and expanded to include executing unique Tactical Missile Maintenance Repair and Overhaul, support repair capabilities for PATRIOT Missile Air Defense System and a variety of Defense Department missile systems to include Avenger, HAWK, MLRS and TOW systems and its ground support equipment.

PATRIOT, the only combat-proven air and missile defense system in the world, is a family of integrated major components of equipment that together form a proven combat multiplier for combatant commanders from the time it was fielded in 1982. The PATRIOT is the U.S. Army’s most advanced air defense system and LEAD has had major role in recapping many PATRIOT missile systems including the ground support and radar equipment. These advancements through implementing Lean initiatives and acquiring new projects continually paved the way for an exciting journey and lasting presence in air defense at LEAD.

LEAD is DoD’s only organic solution for One-Stop Service for Tactical Missile Maintenance, Modification and Integration. All specialized capabilities that support Total Weapon System Maintenance are provided at the depot, including the capabilities to: store, certify, perform GSE rebuild and offer CONUS and OCONUS support to final demil. The Recap Program brings the ground support system to near zero hours/miles and applies the PAC-3 modernization program upgrades.
The fall of 2009 began a new legacy for excellence in the arena of missile and air defense with the completion of a newly constructed 40,000 square foot, $11.6 million, Theater Readiness Monitoring Facility (TRMF). The TRMF was a result of a need to accommodate for new workload created from the BRAC 2005. The BRAC 2005 mandated that depot level missile maintenance activities at Red River Army Depot be relocated to LEAD.

May 2010 officially validated the depot with the capability to process PATRIOT missiles. Mr. Stuart O’Kraski, TRMD-LEAD BRAC IPT Lead, presented COL Cheri Provancha, LEAD Commander and Mr. David Putman, LEAD Theater Readiness Monitoring Directorate, Director, with an Operational Certification and Awards of Recognition at an Initial Operational Capacity Ceremony on June 2, 2010. The ceremony celebrated the month early roll out of its first completed PATRIOT missile. Through the collaboration of the team of Theater Readiness Monitoring Directorate personnel, Raytheon Company and ITT-CAS the complex task of installation and validation at the newly constructed facility was successfully accomplished. More HAWK and PATRIOT equipment will be relocating to LEAD, but for now all is well on schedule.

By June of 2010, COL Cheri Provancha stood before the workforce and accepted the 2010 Shingo Bronze Medallion for the PATRIOT Missile System. Milestones such as these are taking the depot to unparalleled heights of success especially in regards to air defense.

Demonstrating LEAD’s flexibility, LEAD recently converted its primary assembly line of High Mobility Multipurpose Wheeled Vehicles (HMMWVs) to accommodate Reset of PATRIOT Prime Movers. This new workload employed 173 people, with a workload encompassing 150 major items including Launchers, 373 Trailers, Heavy Expanded Mobility Tactical Trucks (HEMTT’s), 900 Series 5 Ton Trucks, Family of Medium Tactical Vehicles (FMTV) and 860 Trailers.

The PATRIOT projects at the depot continue to be a prominent source of work. LEAD has responded in the past and has gained respect for producing a quality product that Soldiers can trust and rely on.

**Serving Warriors in Theater**

As LEAD’s employees realize the significance of their impact on the greater mission, their commitment and determination to their job becomes top priority. Often their dedication exceeds performing their daily duties and goes above and beyond expectations. While maintaining quality production is the workforce’s first priority, another responsibility is to help keep spirits and morale high among those in theater.

Wanting to take their mission a step further, members of the LEAD’s Special Projects Branch, Directorate of Maintenance decided to do something special for the men and women in theater to let them know they are in the thoughts of many back at home.

In four random Rhino crates going overseas they placed a letter, along with a United States flag donated by the Veterans of Foreign War in Shippensburg, PA. Their letter expressed words of gratitude, pride and support of the Warfighter and also requested the units take a photo with their Rhino and flag and send the photo to LEAD with any stories of how the Rhino might have saved troops from harm.

**Ahead**

As the depot looks to the future, it faces the constant pressure and competition to prove itself as a vital and integral source of supply that is beneficial to the Joint Warfighter. To stay flexible, ready and relevant: Letterkenny has transformed its 318,000 square foot vehicle building into a flexible manufacturing floor by using Lean concepts that have eliminated almost 90% of all “monuments.” The depot facilitated each work bay/cell with identical capabilities. Depot employees can now move entire processes, equipment and workload over a weekend with no loss in production time. In some cases, an entire line can be moved and back in operation in one day.

One area of the building has seamlessly converted from PATRIOT Maintenance Vans, to initial assembly of MRAP vehicles, to welding for the Cougar to JERRV conversion to PATRIOT Launchers all within the last year.
Emerging Forecast

Though infrastructure is important, the strength of the depot has been, and continues to be, the depot's workforce. Employees are multi-skilled and highly motivated. The cooperation between the union and management could not be stronger in their resolve to support the Warfighter. Letterkenny employees can see daily the impact their efforts have on the Warfighter. The focus is on cost, quality and schedule. As the winner of the Army’s first Shingo award, Letterkenny employees demonstrated their commitment to continuous improvement.

Letterkenny and the Army are looking for new opportunities to grow partnership opportunities. The newest partnership on the depot is in the Air Defense Arena. Letterkenny and Raytheon have partnered to support the PATRIOT missile system. The goal is to build this partnership into a relationship that will support the growing Foreign Military Sales Program, as well as, future modernization efforts.

Letterkenny has evolved from the original ammunition depot into one of the premier depots in the Army. COL Cheri Provancha emphasizes the need to expand the depots relationship with private industry, “I have challenged the depot to grow our partnerships to approximately 20% of the depot workload,” she said. “It takes the strengths of private industry and the strengths of the organic depots and produces a product that has better quality, is less expensive and in many instances is delivered sooner to our fighting men and women.”

Letterkenny continues to provide outstanding logistical support to our Soldiers. The men and women that work at the depot are dedicated and committed to providing the best possible support to the Armed Forces. Their hard work is recognized by the numerous awards they have received and by their continued drive to improve their processes and lower their costs. When the first shot has to count… Count on Letterkenny!

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A&M would like to clarify the following Army text attributions in the September issue “Brains and Brawn: Modernizing the Bradley Fighting Vehicle” feature:

Lori Grein provided:
“In order to increase the warfighters’ capabilities to identify, engage and destroy enemy targets, two optical improvements have been made as part of the Improved Bradley Acquisition System (IBAS).”

“Vehicles are being equipped with day television cameras and second-generation Forward Looking Infrared optics that include Eyesafe Laser Rangefinders. This upgrade provides M2A2/ M3A2 ODS-SA Bradleys fielded to the National Guard with improved Situational Awareness comparable to the M2A3/ M3A3 Bradley platforms.”

Lt. Col. Glenn Dean stated:
“FLIRs use thermal energy to assist the Warfighter in identifying heated objects that cannot otherwise be detected by the human eye. The cameras are used to increase situational awareness by relaying real-time information through a rear-mounted display unit to crew members located in the back of the vehicle.”
tools for Responders to get the job done in a world where you might be fighting a fire or there may be a secondary incident intended to cause harm. With Intelagard Systems, you have the tools you need for rapid fire suppression, as well as decontamination, and hazmat remediation. For those who believe it’s not ‘if’ but ‘when’, be truly prepared with Intelagard Systems for an effective response.
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